

News from the Savannah River Site

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Primary Media Contact: Lindsey MonBarren
Savannah River Nuclear Solutions
(803) 952-8053
lindsey.monbarren@srs.gov

DOE Media Contact: Susan Clizbe
(803) 952-8281
susan.clizbe@srs.gov

SRS Begins Cleanup of Building Used to Produce Fuel for Space Program

The Department of Energy's managing and operating contractor at the Savannah River Site (SRS), Savannah River Nuclear Solutions (SRNS), recently began cleanup of a building containing residual hold-up of plutonium (Pu)-238, which was used as a heat source to power deep-space missions.

The inactive building, known as 235-F, is a two-story, blast-resistant, windowless, reinforced concrete structure. A section in the building, the former Plutonium Fuel Form (PuFF) Facility, was used to make spheres and pellets out of Pu-238 to electrically power deep space missions, such as the Galileo space probe to Jupiter, launched from the Space Shuttle *Atlantis* in October 1989.

Inside the PuFF facility are nine cells of thick concrete walls with shielded windows. In these cells, employees worked with hazardous materials using remote manipulators from outside the cell. Material entered the PuFF in cell one, then traveled through the other cells to be made into spheres and pellets.

The historic activity has left behind a conservative estimate of about 1,500 grams of Pu-238 in the cells. In order to reduce hazards, SRNS has begun a multi-year Risk Reduction mission in the PuFF facility.

"This project has an ever-increasing number of challenges," said Jack Musall, Project Engineer for the 235-F Risk Reduction Project. "Along with the amount of material involved, we are also working in very tight spaces with limited accessibility. Because of the way the spheres and pellets were made, the Pu-238 was left in some cells as a very fine particulate dust that is easily disturbed. Every move we make will need to be slow, deliberate and precise to avoid spreading contamination."

The workers assigned to this project are a hand-picked team of professionals, most of whom previously worked on the accelerated transuranic waste project at SRS funded by the American Recovery and Reinvestment Act of 2009. To prepare, the workers have been practicing in a mock-up facility and participating in decision-making sessions and briefings.

"They have a proper sense of risk, a proper sense of confidence, and a proper sense of safety," said Michael Gilles, F Area Director. "They're well prepared to deal with what we assume will be an environment where changes will occur."

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The Savannah River National Laboratory (SRNL) has worked with the 235-F Risk Reduction team to develop a better estimate of how much residual Pu-238 remains within the shielded cells. Additionally, SRNL is using existing technology and developing new tools to locate and remove or affix the Pu-238 to ensure it will not become mobile during decontamination activities. Any Pu-238 that is removed, along with any contaminated tools, will be safely stored for eventual packaging and shipment to the Waste Isolation Pilot Plant in New Mexico.

Work completed so far in the facility includes removing fixed combustibles, upgrading the fire detection system, de-energizing unneeded electrical circuits, draining and cleaning shield cell windows after their partial disassembly, and installing light sources.

"As long as we do not run into any new challenges, we estimate that we will complete our mission by 2021," said Gilles. "However, in this type of situation, we anticipate that there will be unforeseen challenges, so we are doing the prep work necessary to have contingencies in place and to ensure the safety of our workers is the highest priority."

"We are committed to reducing risk at SRS, and to removing as much material from the facility as practical," added Musall. "We are proving that commitment through this difficult and challenging project."

Cutline: The Shift Operating Base inside the PuFF Facility was a clean area that allowed operators to use remote manipulators to work with material inside the cells.

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